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MAJORS COST ESTIMATING TOOL WORKSHOP

Cost Estimating Tool Overview

January 19, 2012

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Presentation

- Objectives
- Tool Development
- Estimating Process
- Output options
- Spreadsheet overview
- Estimating Example

THE COLLEGE OF ENGINEERING
UNIVERSITY OF WISCONSIN-MADISON

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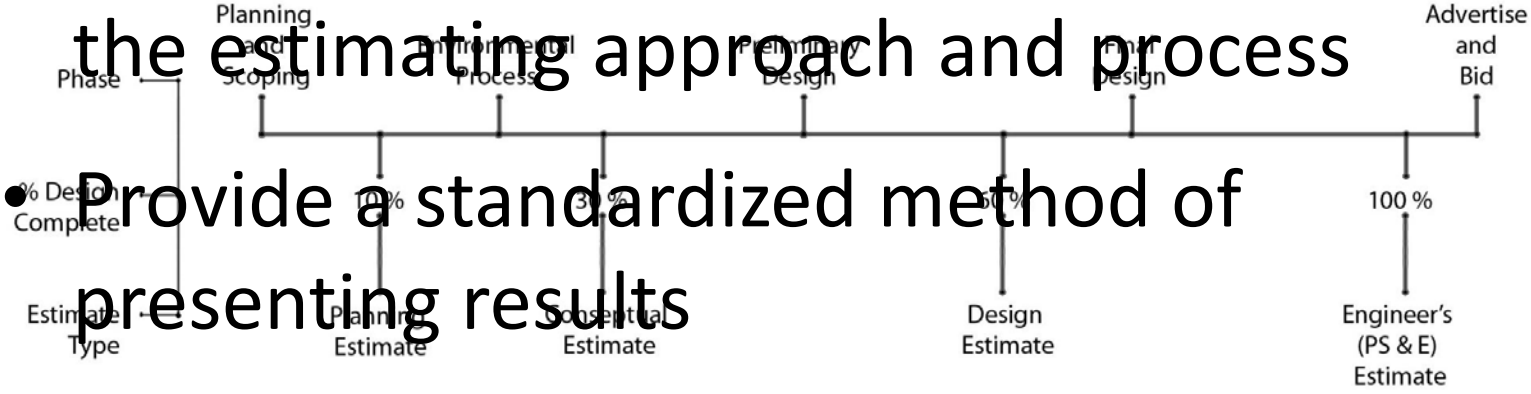
Why?

- Develop a reliable and accurate <u>total</u> project estimate
- Used at the conceptual stage of project development
- Provide uniformity and consistency in the estimating approach and process
- Provide a standardized method of presenting results



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Why? (Continued)

- Format for documenting basis of the estimate, assumptions and calculations
- Structured step by step process so that items are not overlooked
- Establish a baseline project cost and evaluate cost tradeoffs from changes
- Provide accurate information for funding decisions

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Tool Basics

- Major Roadway Item Costs
- Allowance Items & Certainty
- Structure and Specialty Item Costs
- Scope Change and Delivery Allowances
- External Costs
- Risk Adjustments
- Inflation

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Major Roadway Items

- Removing Pavement
- Barrier Wall
- Curb & Gutter
- Earthwork
- Signalized Intersections
- Pavement

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Allowance Items

- Erosion Control
- Lighting
- Roadway Incidentals
- Signing & Marking
- Traffic Control & Staging
- ITS/FTMS

Allowance Item Factors?

- Majors projects bid from 2002 – 2008
- Analyzed bid tabs from **76** individual projects within **14** different corridors
- Items categorized by:
  - Major Roadway Items (MRI)
  - Allowance Items
  - Structures
- Allowance item costs compared to MRI costs

Allowance Item Cost Breakdown

DESCRIPTION COUNTY	SAMPLE CORRIDOR 1 RACINE		SAMPLE CORRIDOR 2 FOND DU LAC	
MAJOR ROADWAY ITEMS (MRI)				
BARRIER WALL	$80,690.75		$35,028.00	
CURB & GUTTER	$513,137.69		$175,199.25	
EARTHWORK	$16,226,260.65		$2,314,167.40	
PAVEMENT, BASE, SUBBASE	$28,298,043.92		$6,970,200.90	
REMOVING PAVEMENT	$85,968.30		$274,281.30	
TOTALS	**$45,204,101.31**		**$9,768,876.85**	
STRUCTURES	**$11,973,906.10**		**$4,681,081.41**	
ALLOWANCE ITEMS		*% of MRI*		*% of MRI*
DRAINAGE	$2,816,047.64	*6.2%*	$615,673.77	*6.3%*
EROSION CONTROL & RESTORATION	$2,498,271.97	*5.5%*	$589,204.05	*6.0%*
LIGHTING	$29,507.92	*0.1%*	$70,339.20	*0.7%*
ROADWAY INCIDENTALS	$6,165,175.20	*13.6%*	$2,444,974.66	*25.0%*
SIGNING/MARKING	$476,942.74	*1.1%*	$262,557.64	*2.7%*
TRAFFIC CONTROL & STAGING	$769,030.74	*1.7%*	$831,413.49	*8.5%*
TOTALS	**$12,754,976.21**	***28.2%***	**$4,814,162.80**	***49.3%***
CONTRACT TOTAL LOW BID	**$69,932,983.61**		**$19,264,121.06**	

Allowance Items Data				
Minimum	**Average**	**Maximum**	**EV**	**Variance**
4.1%	7.5%	14.4%	8.11%	0.030%
4.8%	6.7%	7.9%	6.57%	0.003%
0.0%	0.6%	3.4%	1.00%	0.003%
7.3%	17.1%	47.4%	20.50%	0.447%
1.1%	1.9%	4.1%	2.15%	0.003%
0.5%	2.9%	8.5%	3.42%	0.018%
				0.50%
			41.75% EV	7.09% SD

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Allowance Certainty Factor

- A confidence level that the actual project costs will be “less than” the estimated costs.
- Expressed as a percentage
- The higher the certainty factor selected, the higher the resulting estimate
- Likelihood of overestimating the cost of the allowance items

Scope Change & Delivery Allowance

- Scope change allowance
  - Design contingency
- Project delivery allowance
  - Preliminary Engineering
  - Final Engineering
  - Construction Engineering
  - Construction Change Orders & Claims
  - Traffic Mitigation
  - Public Involvement

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7. Scope Change & Delivery Allowance Items

- Surveyed all 5 Regions, averaged results by project type, and rounded up to nearest whole percentage

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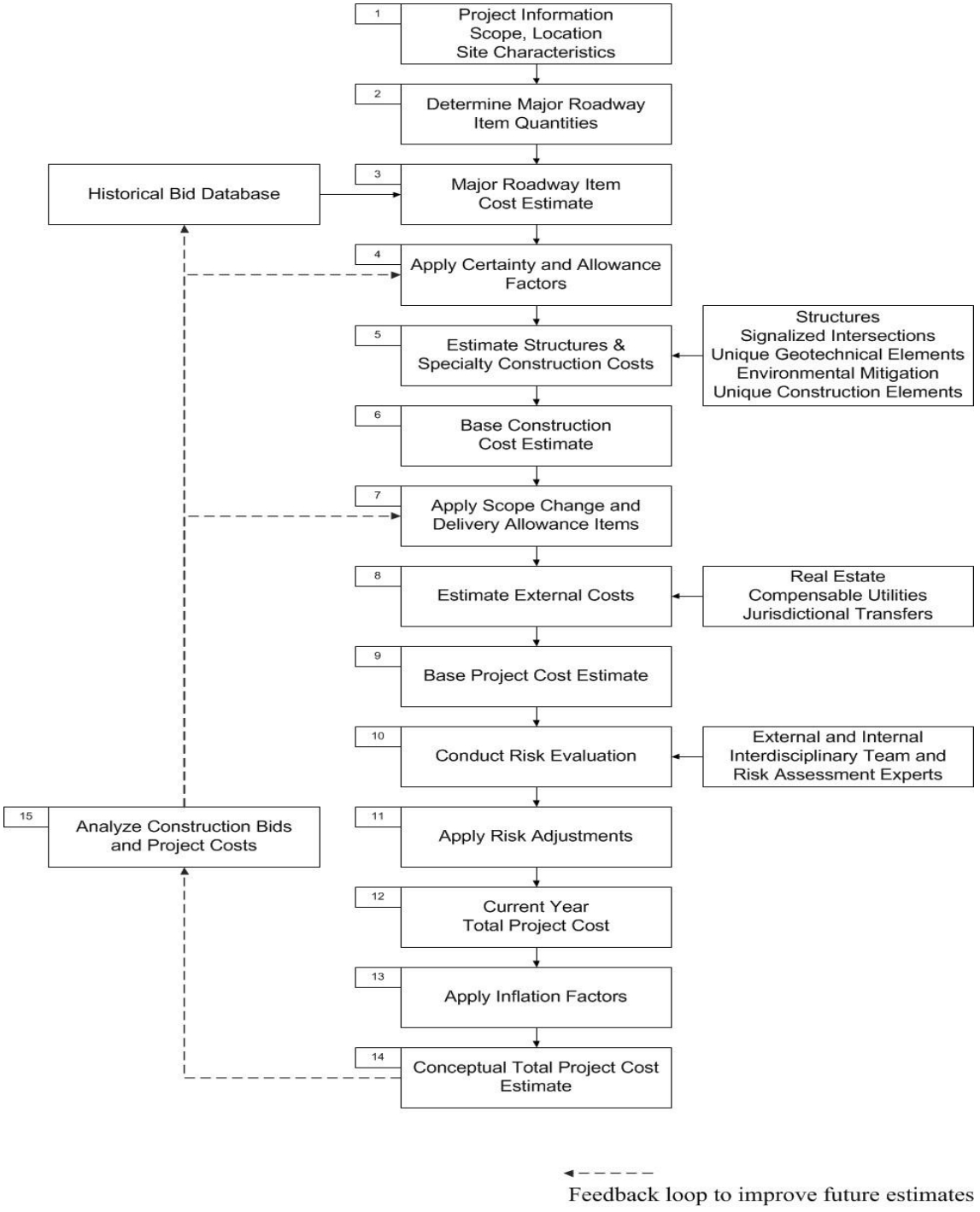

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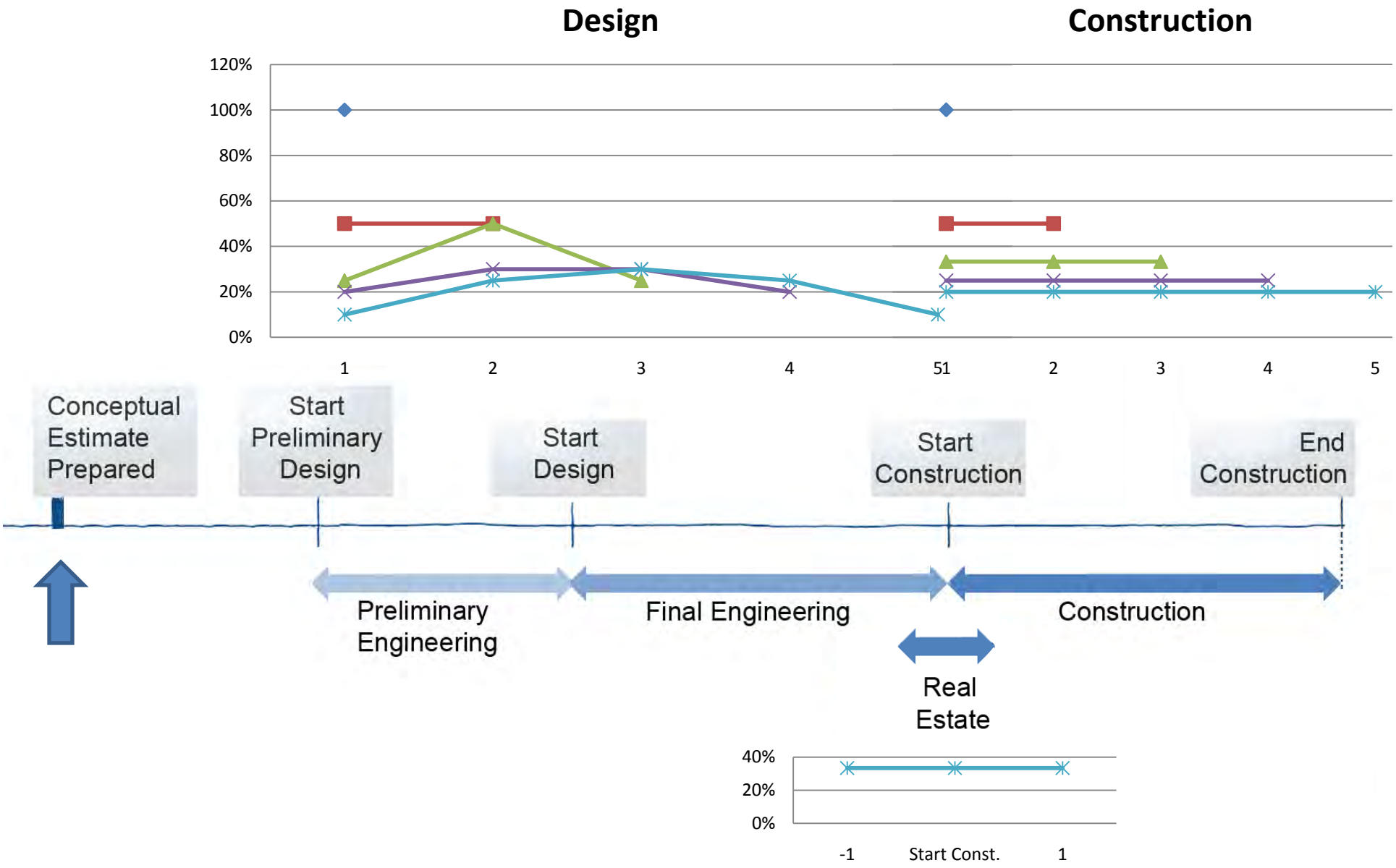
Output Format

Base Year $	1	2	3	4	5	6	7	8
Design								
Real Estate								
Construction								
TOTAL								

Inflated $	1	2	3	4	5	6	7	8
Design								
Real Estate								
Construction								
TOTAL								

Cost Distribution Method



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Majors Estimating Tool

- Spreadsheet
- Estimating Example